Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force											Date: February 2016	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	267.023	294.455	228.095	259.131	0.000	259.131	237.784	428.286	827.358	1,342.519	Continuing	Continuing
657103: *Advanced MILSATCOM*	191.032	181.439	53.475	31.007	0.000	31.007	0.000	0.000	0.000	0.000	0.000	456.953
657104: *Evolved AEHF MILSATCOM (EAM)*	75.991	113.016	174.620	228.124	0.000	228.124	237.784	428.286	827.358	1,342.519	Continuing	Continuing
Program MDAP/MAIS Code: 261												

Note

This program, BA 05 PE 0605431F, project 657104, Protected Tactical Enterprise Service (PTES), is a new start.

In FY2017, Project 657104, Evolved AEHF MILSATCOM, includes one new start effort, Protected Tactical Enterprise Services (PTES).

In FY2014, Project 657103, Advanced MILSATCOM, and Project 657104, Evolved AEHF MILSATCOM, efforts were transferred from PE 0603430F, Advanced EHF MILSATCOM (Space), Project 644050, Advanced MILSATCOM, and Project 64A030, Evolved AEHF MILSATCOM, in order to transition to Budget Activity 5.

A. Mission Description and Budget Item Justification

Develop and acquire Advanced Extremely High Frequency (AEHF) Military Satellite Communications (MILSATCOM) satellites, mission control segment and cryptography for survivable, anti-jam, worldwide, secure communications for the strategic and tactical warfighters. AEHF satellites will replenish the existing EHF system (Milstar) providing much higher capacity and data rate (5x increase over Milstar II) capabilities. AEHF is a cooperative program that includes International Partners (Canada, the United Kingdom, and the Kingdom of the Netherlands).

Space Vehicle-1 (SV-1) launched on 14 August 2010. SV-1 experienced a propulsion anomaly and was raised to its geostationary orbit using alternative orbit raising techniques. SV-1 completed on-orbit test and transitioned to operations in March 2012. SV-2 launched on 4 May 2012, successfully completed on-orbit testing in October 2012, and is under operational control as of 7 November 2012. AEHF Initial Operational Capability (IOC) was declared on 28 July 2015.

With SV-1 and SV-2 launched and Initial Operational Capability (IOC) declared on 28 July 2015, the AEHF program has nearly completed its development phase and is now addressing obsolescence, production continuity, supplier stability and industrial base issues. AEHF SV 5-6 are being procured using the Department of Defense (DoD) Efficient Space Procurement (ESP) concept. The ESP concept is a procurement approach which seeks stable production and efficient sub-contractor product management through the block buy of two space vehicles at one time (as described in Advanced EHF MILSATCOM P-40 Exhibit). In addition, the ESP concept includes use of RDT&E funding to perform systems engineering, architecture development and other activities to meet current and future emerging SATCOM requirements.

Additionally, RDT&E funds support the MILSATCOM Space Modernization Initiative (SMI), which conducts engineering activities to reduce future production costs through manufacturing and producibility enhancements, improve capabilities through insertion of new technologies, and replace obsolete parts, crypto and materials.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force	Date: February 2016
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*

The SV-6 crypto design and AEHF Capabilities Insertion Program (CIP) are reported as part of the AEHF (SV 5-6 Subprogram) and AEHF (SV 1-4 Subprogram) baselines, respectively. The remaining SMI efforts are not part of the AEHF Major Defense Acquisition Program. The SMI efforts will provide opportunities for competition to develop potential technology upgrades at the component and system level for future satellites of the current or any follow-on system. SMI efforts will include obsolescence management and mitigation, technology maturation, new components' qualification, subsystem and component prototyping, architecture and system concept studies (to include hosted payloads), and pathfinder efforts to address MILSATCOM capability gaps identified in the Joint Space Communications Layer (JSCL) Initial Capabilities Document (ICD) and the "Resilient Basis for SATCOM in Joint Operations" study, and recently assessed in the Protected Satellite Communications Services (PSCS) Analysis of Alternatives (AoA). The purpose of the PSCS AoA is to evaluate alternative space and control segment architectures, along with the associated user segment, to address the required protected satellite communications capabilities in the nuclear, contested, and benign operating environments.

MILSATCOM SMI efforts are funded in Project 657104, Evolved AEHF MILSATCOM (EAM).

In FY17, this Program Element supports Enterprise Ground Services (EGS). EGS is performing tech maturation, experiments and prototyping for increased commonality and resiliency in space program ground systems.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	307.898	228.230	257.254	0.000	257.254
Current President's Budget	294.455	228.095	259.131	0.000	259.131
Total Adjustments	-13.443	-0.135	1.877	0.000	1.877
• Congressional General Reductions	0.000	-0.135			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	-4.799	0.000			
• SBIR/STTR Transfer	-8.644	0.000			
• Other Adjustments	0.000	0.000	1.877	0.000	1.877

Change Summary Explanation

FY2017 net change is +$1.877M which is composed of the following: +$10.0M restored for next generation AEHF key management architecture; +$15.4M for AEHF Capabilities Insertion Program (CIP) Mission Control Segment Increment 8.2; -$20.94M, due to insufficient topline to close capacity and capability gaps the Protected Tactical Service (PTS) Initial Launch Capability was delayed three years from 2024 to 2027; -$2.583M inflation adjustment.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	Project (Number/Name) 657103 / *Advanced MILSATCOM*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
657103: *Advanced MILSATCOM*	191.032	181.439	53.475	31.007	0.000	31.007	0.000	0.000	0.000	0.000	0.000	456.953
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Additional Prior Years funds for Advanced EHF MILSATCOM (Space) are in PE 0603430F, Project 644050, Advanced MILSATCOM, Budget Activity 4.

A. Mission Description and Budget Item Justification

Develop and acquire Advanced Extremely High Frequency (AEHF) Military Satellite Communications (MILSATCOM) satellites, mission control segment and cryptography for survivable, anti-jam, worldwide, secure communications for the strategic and tactical warfighters. AEHF satellites will replenish the existing EHF system (Milstar) providing much higher capacity and data rate (5x increase over Milstar II) capabilities.

AEHF is a cooperative program that includes International Partners (Canada, the United Kingdom, and the Kingdom of the Netherlands).

Space Vehicle-1 (SV-1) launched on 14 August 2010. SV-1 experienced a propulsion anomaly and was raised to its geostationary orbit using alternative orbit raising techniques. SV-1 completed on-orbit test and transitioned to operations in March 2012. SV-2 launched on 4 May 2012, successfully completed on-orbit testing in October 2012, and is under operational control as of 7 November 2012. AEHF Initial Operational Capability (IOC) was declared on 28 July 2015.

Advanced EHF and Enhanced Polar System (EPS) Key Management Architectures (KMA) are not compatible with the National Security Agency's new enterprise system, Key Management Infrastructure (KMI). Per the Acquisition Decision Memorandum signed by (USD)AT&L on 17 June 2013, the Air Force shall transition the AEHF and EPS KMA from the Electronic Key Management System (EKMS) to the KMI by Dec 2017. This funding supports development, acquisition, integration and testing of a Protected SATCOM Key Management Architecture (PKMA) that will replace the legacy EKMS to be compatible with the KMI by December 2017.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: AEHF Interim Contractor Support (ICS)	109.445	0.000	0.000
Description: Funds ICS for first two AEHF satellites, Mission Control Segment (MCS), Cryptography, and AEHF Calibration Facility (ACF) until IOC declaration			
FY 2015 Accomplishments: Continued ICS for AEHF satellites' on-orbit support, MCS, AEHF Key Management Architecture, and ACF leading to the 28 July 2015 IOC declaration.			
FY 2016 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657103 / *Advanced MILSATCOM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
N/A ***FY 2017 Plans:*** N/A			
Title: AEHF Key Management Infrastructure (KMI) transition ***Description:*** Develop and conduct systems engineering, integration and test of the Protected SATCOM Key Management Architecture (PKMA). National Security Agency (NSA) will lead the development of the PKMA centralized elements. Enable testing and integration of AEHF Local Key Management functionality within the KMI client with the AEHF system. Initiate PKMA integration activities with the AEHF prime contractor and the Enhanced Polar System (EPS) Control and Planning Segment (CAPS) contractor. ***FY 2015 Accomplishments:*** Completed Developmental Test and Evaluation (DT&E) events to inform the National Security Agency (NSA) Operational Acceptance (FY 2016) of Protected SATCOM Key Management Architecture (PKMA). Transferred funds to NSA for the development and testing of PKMA centralized elements, and integration testing of the AEHF Local Key Management functionality within the KMI client with the AEHF system. Initiated PKMA integration activities with the satellite vehicle control segment prime contractors, Lockheed Martin and Northrop Grumman. ***FY 2016 Plans:*** Continue KMI transition. Transfer funds to NSA to develop Protected SATCOM Key Management Architecture (PKMA) critical factory components (FY2016) and support test and deficiency resolution of PKMA elements. Continue testing AEHF Local Key Management functionality, with the KMI client, and AEHF system. Develop and execute transition and testing with Lead Developmental Test Organization (LDTO), AEHF prime contractor, Lockheed Martin, and EPS CAPS contractor, Northrop Grumman Information Systems. ***FY 2017 Plans:*** Start operational test period, and transition AEHF & EPS operations to Protected SATCOM Key Management Architecture (PKMA). Begin pre-operational support of PKMA centralized elements.	71.994	53.475	31.007
Accomplishments/Planned Programs Subtotals	181.439	53.475	31.007

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657103 / *Advanced MILSATCOM*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• MPAF: BA05: Line Item # ADV555: *Advanced EHF*	298.462	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4,587.035
• SPAF: BA01: Line Item # ADV555: *Advanced EHF*	0.000	327.666	645.569	0.000	645.569	56.854	29.299	31.180	31.742	0.000	1,122.310
• RDT&E: BA05: PE 0605433F: *Wideband Global SATCOM (Space)*	14.095	8.646	12.248	0.000	12.248	10.168	0.000	0.000	0.000	0.000	290.756

Remarks

Wideband Global SATCOM (Space) funding is within the Command and Control System - Consolidated (CCS-C) project.

D. Acquisition Strategy

The Advanced MILSATCOM, also known as Advanced EHF (AEHF), program is a sole source acquisition to a contractor team comprised of Lockheed Martin (prime/integrator) and Northrop Grumman (provider of the satellite payload). This team performed the Advanced Component Development and Prototypes (ACD&P) and Systems Development and Demonstration (SDD) of two RDT&E-funded satellites and associated mission command and control ground capabilities under Cost Plus Award Fee line items on the contract. AEHF incorporated lessons learned and improvements from Milstar and commercial SATCOM practices into the next generation EHF secure, anti-jam military communications satellite system.

The Protected SATCOM Key Management Architecture (PKMA) acquisition is a software development effort to update DoD secure satellite communication encryption systems and become compatible with the National Security Agency's enterprise Key Management Infrastructure (KMI). The Acquisition Decision Memorandum was signed by (USD)AT&L on 17 June 2013. The prime contractor for the PKMA development under the NSA is Leidos with subcontracts to L3 Communications and General Dynamics.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657103 / *Advanced MILSATCOM*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Crypto Interim Contractor Support	MIPR	Cryptologic Sys Group : San Antonio, TX	10.100	0.000		0.000		0.000		0.000		0.000	0.000	10.100	20.300
AEHF SVs 1-2 and MCS Interim Contractor Support	SS/CPIF	Lockheed Martin : Sunnyvale, CA	109.901	104.238	Dec 2014	0.000		0.000		0.000		0.000	0.000	214.139	207.561
GFP - AEHF Calibration Facility (ACF)	Various	Lincoln Labs : Lexington, MA	3.286	0.000		0.000		0.000		0.000		0.000	0.000	3.286	3.286
PKMA MIT/LL Test Support	Various	Lincoln Labs : Lexington, MA	0.000	0.200	Apr 2015	0.496	Apr 2016	0.509	Apr 2017	0.000		0.509	0.000	1.205	-
New KMI Component Development	MIPR	NSA : Ft Meade, MD	54.800	52.244	Dec 2014	37.871	Dec 2015	8.864	Dec 2016	0.000		8.864	0.000	153.779	158.861
Enterprise SE&I	C/CPIF	Linquest Corp : Los Angeles, CA	0.000	1.141	Jul 2016	1.662	Jul 2017	1.662	Jul 2018	0.000		1.662	0.000	4.465	-
NSA Interim Contractor Support	MIPR	NSA : Ft Meade, MD	0.000	0.000		0.000		10.000	Dec 2016	0.000		10.000	0.000	10.000	10.000
Install/Integrate/Test New AEHF KMI Components	SS/CPIF	Lockheed Martin : Sunnyvale, CA	3.979	5.825	Mar 2015	2.659	Apr 2016	0.000		0.000		0.000	0.000	12.463	12.464
Install/Integrate/Test New EPS KMI Components	SS/CPIF	Northrop Grumman Information Systems : Redondo Beach, CA	0.000	6.959	Nov 2015	5.127	Apr 2016	0.000		0.000		0.000	0.000	12.086	13.442
Test New KMI Hardware/ Software	MIPR	AFLCMC : San Antonio, TX	1.946	5.500	Aug 2015	2.542	Apr 2016	7.042	Apr 2017	0.000		7.042	0.000	17.030	21.893
Operational Test Support	Various	17th Test Sqd : Peterson, CO	0.000	0.050	Jan 2015	0.323	Nov 2015	0.172	Nov 2016	0.000		0.172	0.000	0.545	-
		Subtotal	184.012	176.157		50.680		28.249		0.000		28.249	0.000	439.098	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	Project (Number/Name) 657103 / *Advanced MILSATCOM*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation Support	Various	Various : Various	0.250	0.000		0.000		0.000		0.000		0.000	0.000	0.250	-
		Subtotal	0.250	0.000		0.000		0.000		0.000		0.000	0.000	0.250	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	RO	The Aerospace Corporation : El Segundo, CA	1.742	1.404	Dec 2014	0.000		0.000		0.000		0.000	0.000	3.146	-
A&AS	Various	Various : Various	5.028	3.802	Dec 2014	2.719	Dec 2015	2.728	Dec 2016	0.000		2.728	0.000	14.277	-
Other Support	Various	Various : Various	0.000	0.076	Oct 2014	0.076	Oct 2015	0.030	Oct 2016	0.000		0.030	0.000	0.182	-
		Subtotal	6.770	5.282		2.795		2.758		0.000		2.758	0.000	17.605	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	191.032	181.439		53.475		31.007		0.000		31.007	0.000	456.953	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657103 / *Advanced MILSATCOM*

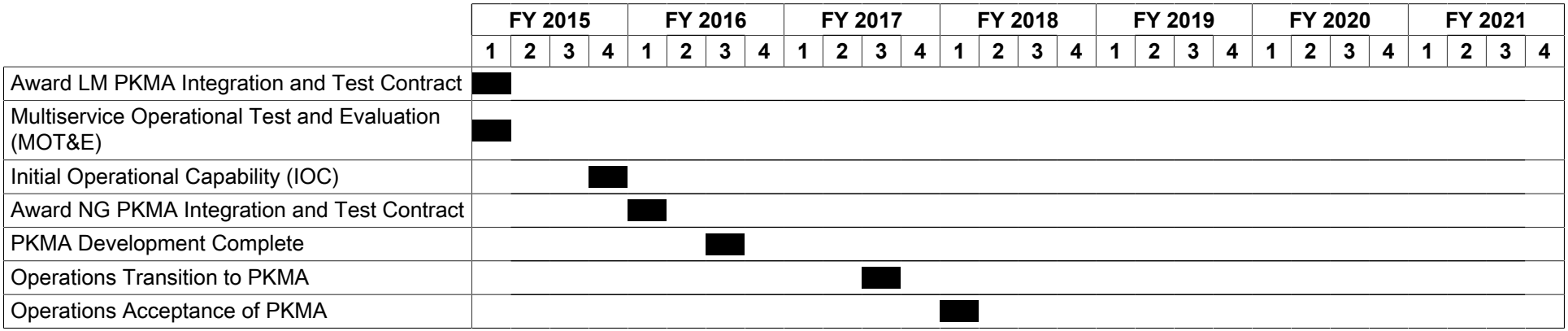

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657103 / *Advanced MILSATCOM*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Award LM PKMA Integration and Test Contract	1	2015	1	2015
Multiservice Operational Test and Evaluation (MOT&E)	1	2015	1	2015
Initial Operational Capability (IOC)	4	2015	4	2015
Award NG PKMA Integration and Test Contract	1	2016	1	2016
PKMA Development Complete	3	2016	3	2016
Operations Transition to PKMA	3	2017	3	2017
Operations Acceptance of PKMA	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	Project (Number/Name) 657104 / *Evolved AEHF MILSATCOM (EAM)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
657104: *Evolved AEHF MILSATCOM (EAM)*	75.991	113.016	174.620	228.124	0.000	228.124	237.784	428.286	827.358	1,342.519	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program, BA 05 PE 0605431F, project 657104, Protected Tactical Enterprise Service (PTES), is a new start.

Additional Prior Years funds for Advanced EHF MILSATCOM (Space) are in PE 0603430F, Project 64A030, Evolved AEHF MILSATCOM, Budget Activity 4.

A. Mission Description and Budget Item Justification

The Space Modernization Initiative (SMI) strategy is to evolve current and future Protected MILSATCOM systems and develop a more affordable and resilient MILSATCOM enterprise capable of meeting near term and emerging MILSATCOM requirements. A significant thrust for this initiative is to demonstrate technologies and Concepts of Operations (CONOPS) that lead to a future Protected Tactical Service (PTS) that provides tactical-level MILSATCOM users protected, anti-jam satellite communications while operating in a contested environment. The protected tactical service will provide tactical users significantly higher data rates than AEHF and a security architecture that enables forward deployed users to have protected satellite communications in scenarios where AEHF terminals cannot be deployed. Under this construct the SMI will: 1) Reduce parts/obsolescence risk to future AEHF space vehicles, 2) Continue the AEHF Capabilities Insertion Program (CIP) to enhance the current AEHF constellation performance, 3) Define requirements and acquisition strategy for a future National Command, Control, and Communications (NC3) evolved strategic system, 4) Invest in technologies/demonstrations/CONOPS that enable a future Protected Tactical Service capability by continued development of the Protected Tactical Waveform (PTW) technologies, maturing the Protected Tactical Testbed, and demonstrating resilient and affordable wideband protected technologies and CONOPS, 5) Begin the Protected Tactical Enterprise Service (PTES) program (and transition to new Program Element in FY18) to provide the enabling joint ground system for future PTW operations, and 6) Evaluate other potential commercial technologies that are capable of meeting current and future emerging SATCOM requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Title: AEHF SV-6 Flight Crypto & Future AEHF Parts Obsolescence Mitigation	20.000	0.000	0.000
Description: AEHF SV-6 flight cryptographic equipment redesign effort and future AEHF parts obsolescence mitigation effort. Included in PNO 261.			
FY 2015 Accomplishments: Completed the SV-6 flight crypto effort and the AEHF parts/obsolescence effort.			
FY 2016 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657104 / *Evolved AEHF MILSATCOM (EAM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
N/A ***FY 2017 Plans:*** N/A			
Title: AEHF Capabilities Insertion Program (CIP) ***Description:*** Develop software that will increase the current AEHF constellation capacity by 10%, broaden overall user base, and accommodate a larger user population through improved resource utilization efficiencies. Develop software to increase current AEHF terminal data rates with adaptive coding algorithms. Theses efforts are included in PNO 261. ***FY 2015 Accomplishments:*** Completed Phase I (INC 7.6) of the MCS software development. Awarded Phase II (INC 8.0) capability improvements, including Internal Process Reviews (IPRs) to assess design suitability and implementation of functionality to deliver increased system capacity. ***FY 2016 Plans:*** Complete Phase II (INC 8.0) development and begin verification. Award and begin Phase III (INC 8.1) development to deliver faster tactical planning, improved international partner communication planning and terminal lock-on, and implement other improvements. ***FY 2017 Plans:*** Complete Phase II (INC 8.0) verification. Continue Phase III (INC 8.1) development. Award and begin Phase IV (INC 8.2) development to accommodate a larger user population through improved communication planning, frequency planning and other improvements.	43.626	32.116	31.900
Title: Evolved AEHF ***Description:*** The Evolved AEHF (E-AEHF) provides nuclear survivable, protected military satellite communications (MILSATCOM) to eXtended Data Rate (XDR) users only. E-AEHF supports strategic mission requirements such as Presidential and National Voice Conferencing (PNVC), Nuclear Command and Control (NC2) strategic networks, terminal report back, and Emergency Action Message (EAM) dissemination. ***FY 2015 Accomplishments:*** Began system definitions and early requirements/acquisition planning. ***FY 2016 Plans:***	1.539	14.323	36.000

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657104 / *Evolved AEHF MILSATCOM (EAM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Continue requirements/architecture/acquisition strategy development activities. Conduct threat analysis, ground architecture assessments and identify opportunities for improving system resiliency. ***FY 2017 Plans:*** Engage industry to refine requirements tradeoffs and begin applicable risk reduction efforts. Continue development of acquisition strategy and associated documentation.			
Title: Protected MILSATCOM "Design for Affordability" and Protected Testbed ***Description:*** Perform design for affordability studies, demonstrations, and technology risk reduction on critical technology elements for the space payload, terminals and networking segments, with a focus on the Protected Tactical Waveform (PTW) and continue to develop the Protected Tactical testbed in support of the Protected Tactical demonstration efforts. ***FY 2015 Accomplishments:*** Conducted PTW component level demonstrations over wideband systems using existing fielded terminals with newly designed contractor provided PTW brassboard modems, matured the PTW technology, generated PTW modem test reports, and continued to develop the PTW specification and interface documents. Designed and matured the Protected Tactical Testbed components, mission management segments, key management areas, and performed PTW modem over the air (OTA) test with contractor modems and tested newly developed hardware and software components for PTW. ***FY 2016 Plans:*** Conduct Protected Testbed PDR, CDR and intersegment compatibility testing. Expand on the terminal and space/ground prototype to provide the ground functionality required for future protected tactical waveform testing. Continue to develop ground hub test events, demo contractor developed PTW modems, conduct interim network test, conduct OTA PTW testing to verify contractor developed software and hardware, continue to enhance the Protected Tactical Testbed that supports PTW functional interface testing with operational wideband systems and acquire operational wideband terminals. Deliver three testbed simulators to contractors for early risk-reduction and developmental testing in preparation for follow-on over-the-air demonstrations. ***FY 2017 Plans:*** Support three contractor modem-to-testbed PTW compatibility demonstrations in support of the Protected Tactical Demonstration. Finalize hardware baseline to support over-the-air demonstrations over WGS and Commercial SATCOM for the Protected Tactical Demonstration. Conduct intersegment integration events. Complete remaining intersegment testing. Prepare testbed for future systems integration lab events supporting the development of terminal modems. Support further definition and refinement of PTW ICD and other interface documents and standards in preparation for operational use of PTW over wideband systems.	30.391	32.851	37.406
Title: Protected Tactical Demonstration	17.460	95.330	93.518

Exhibit R-2A, RDT&E Project Justification: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657104 / *Evolved AEHF MILSATCOM (EAM)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Description: The Protected Tactical Demonstration will develop and demonstrate prototype Terminal Modem (TM) Line Replaceable Units (LRUs) utilizing PTW over wideband space/ground systems with an option to demonstrate over a commercial SATCOM system and design and build the Mission Management System (MMS) simulator. Develop PTW components, protected tactical terminal modems that will be capable of being fully integrated into existing wideband terminals, and a new End Cryptographic Unit (ECU) that will support the PTW. The ECUs will be integrated with the PTW modem and certified by NSA. The Protected Tactical Field Demonstration will demonstrate an Anti-Jam (AJ) and Low Probability of Intercept (LPI)/Low Probability of Detection (LPD) communications capability that can be provided to tactical users in all Services through fielded terminals, existing wideband MILSATCOM assets, and potential COMSATCOM assets. Conduct trade space and requirements definition to support future PTW-related capabilities. Identify potential assets such as ground hubs and information assurance components that can be further developed by future PTW-related programs for wideband users and explore releasability of PTW-related technologies to International Partners. ***FY 2015 Accomplishments:*** Developed and delivered government designed Protected Tactical Waveform (PTW) modem and ECU requirements; established technical baseline and issued solicitation for modem contracts; designed and built demo MMS simulators and requirements, and prepared for System Design Review (SDR). ***FY 2016 Plans:*** Award up to three contracts for the development of TM LRUs to support the Protected Tactical Demonstration, review system/ functional requirements, conduct SDR, and prepare for PDR and CDR. Continue further development of all contractors' developed prototype PTW terminal modems and ECUs; continue to mature and test MMS simulators; demo and test the MMS simulator with the ground hub and Key Management System; continue to develop/mature requirements and interface control documents for protected tactical system components. Conduct other risk reduction tests with hub, KMS, and MMS simulators. ***FY 2017 Plans:*** Conduct both PDR and CDR, and baseline terminal modem and ECU requirements in preparation for contractor-built modem and ECU test articles. Support contractor-led factory test events of terminal modem and ECU. Exercise contract option for entrance into compatibility testing phase of demonstration. Ensure compatability of terminal modem and ECU with government testbed simulators.			
Title: Protected Tactical Enterprise Service (PTES)	0.000	0.000	19.800
Description: The Protected Tactical Enterprise Service will provide the enabling joint ground system for future PTW operations. This PTES includes Joint PTW Hubs at existing WGS teleports and the required Mission Management and Key Management Systems (MMS/KMS) needed to support PTW operations over any wideband system as well as any planned future dedicated PTW-capable systems. PTES will enable, along with the Terminal Modem Line Replaceable Units developed during the			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
Protected Tactical Demonstration, an Anti Jam (AJ) and Low Probability of Intercept (LPI)/Low Probability of Detection (LPD) communications capability over WGS for tactical users in all Services and International Partners. ***FY 2015 Accomplishments:*** N/A ***FY 2016 Plans:*** N/A ***FY 2017 Plans:*** Complete technical baseline and system requirements. Conduct source selection and award risk reduction/development contracts for the joint ground system.			
Title: Enterprise Ground Services (EGS) ***Description:*** Enterprise Ground Services (EGS) is envisioned to provide a robust enterprise ground architecture for Air Force space systems, which leverages mission commonality and automation to reduce sustainment costs and re-focus manpower on warfighting capabilities. In addition, EGS will enable a near-real-time common operating picture of enterprise-wide tactical health, status, indications, and warnings for Air Force satellites. The end-state will be a modern technical infrastructure which is cyber-secure and resilient against the Advanced Persistent Threat and employs streamlined architecting, acquisition, and operational processes. Through early architecture studies and prototyping, the government will establish clear ownership of the technical baseline to meet Better Buying Power principles as the EGS effort evolves through development. This effort provides focus and expertise for the development, test, certification and enforcement of standards and interfaces for all AFSPC satellite ground systems to enable transition planning for legacy ground systems, new capability demonstrations, and systems acquisition leading to an enterprise ground architecture for Air Force space systems. ***FY 2015 Accomplishments:*** N/A. ***FY 2016 Plans:*** N/A. ***FY 2017 Plans:*** Conduct developmental planning, mature technologies, and develop initial small-scale prototype capability for the enterprise ground architecture. Efforts in 2017 will include, but not be limited to, systems engineering, special studies, cyber security planning and implementation, standards and interface development and codification, integration and test efforts in support of	0.000	0.000	9.500

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2015	FY 2016	FY 2017
demonstrations, and operational architecture planning. In addition, this effort will build the technical and programmatic roadmap to enable a phased enterprise transition in the future.			
Accomplishments/Planned Programs Subtotals	113.016	174.620	228.124

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• MPAF: BA05: Line Item # ADV555: *Advanced EHF*	298.462	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4,587.035
• SPAF: BA01: Line Item # ADV555: *Advanced EHF*	0.000	327.666	645.569	0.000	645.569	56.854	29.299	31.180	31.742	0.000	1,122.310

Remarks

D. Acquisition Strategy

MILSATCOM SMI includes parts obsolescence redesign and incremental capability upgrades for potential future block buys contracted with current Prime contractor team. Enterprise studies, system design for affordability, protected tactical awards and risk reduction efforts for next generation capabilities will include full and open competition efforts.

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force			Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657104 / *Evolved AEHF MILSATCOM (EAM)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AEHF SV-6 Flight Crypto and Future Parts Obsolescence Mitigation	SS/CPIF	Lockheed Martin : Sunnyvale, CA	14.391	20.000	Dec 2014	0.000		0.000		0.000		0.000	0.000	34.391	-
AEHF Capabilities Insertion Program (CIP)	SS/CPIF	Lockheed Martin : Sunnyvale, CA	14.325	43.626	Jul 2015	24.243	Jun 2016	31.900	Jun 2017	0.000		31.900	Continuing	Continuing	56.151
Protected MILSATCOM "Adaptive Coding"	Various	MIT/LL : Lexington, MA	1.899	0.000		0.000		0.000		0.000		0.000	0.000	1.899	-
Protected MILSATCOM "Design for Affordability" Phase 3 BAA #1	C/FFP	The Boeing Company : El Segundo, CA	5.995	0.000		0.000		0.000		0.000		0.000	0.000	5.995	5.995
Protected MILSATCOM "Design for Affordability" Phase 3 BAA #2	C/FFP	Loral : Palo Alto, CA	4.400	0.000		0.000		0.000		0.000		0.000	0.000	4.400	4.400
Protected MILSATCOM "Design for Affordability" Phase 3 BAA #3	C/FFP	Raytheon : Marlborough, MA	3.981	0.000		0.000		0.000		0.000		0.000	0.000	3.981	3.981
Protected MILSATCOM "Design for Affordability" Phase 3 BAA #4	C/FFP	L3 COM - West : Salt Lake City, UT	3.374	0.000		0.000		0.000		0.000		0.000	0.000	3.374	3.374
Protected Tactical Demonstration (Modem)	TBD	TBD : TBD	0.000	0.000		64.974	May 2016	67.460	Jan 2017	0.000		67.460	Continuing	Continuing	-
Protected Tactical Demonstration (Mission Management System simulator)	Various	Various : Various	0.000	11.490	Oct 2014	10.245	Jan 2016	10.955	Jan 2017	0.000		10.955	Continuing	Continuing	-
Technical Mission Analysis	MIPR	Aerospace : El Segundo, CA	0.000	0.000		2.999	Oct 2015	2.033	Oct 2016	0.000		2.033	Continuing	Continuing	-
Evolved AEHF (E-AEHF)	Various	Various : Various	0.000	1.539	Jul 2015	8.239	Jan 2016	33.102	Jan 2017	0.000		33.102	Continuing	Continuing	-
Protected Testbed	Various	MIT/LL : Various	7.030	11.493	Dec 2014	32.851	Jan 2016	19.792	Jan 2017	0.000		19.792	Continuing	Continuing	-
Protected Tactical Enterprise Services (PTES)	TBD	TBD : TBD	0.000	0.000		0.000		18.595	Apr 2017	0.000		18.595	Continuing	Continuing	-

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enterprise SE&I	C/CPAF	Linquest : Los Angeles, CA	4.030	9.096	Dec 2014	11.062	Jan 2016	11.542	Jan 2017	0.000		11.542	Continuing	Continuing	-
Enterprise Ground Services (EGS)	Various	Various : Various	0.000	0.000		0.000		9.500	Jan 2017	0.000		9.500	0.000	9.500	-
		Subtotal	59.425	97.244		154.613		204.879		0.000		204.879	-	-	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-		-	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FFRDC	Various	Various : Various	10.832	10.800	Jan 2015	9.473	Jan 2016	10.526	Jan 2017	0.000		10.526	Continuing	Continuing	-
Other Support	Various	Various : Various	0.160	0.101	Dec 2014	0.100	Dec 2015	0.100	Dec 2016	0.000		0.100	Continuing	Continuing	-
A&AS	Various	Various : Various	5.574	4.871	Dec 2014	10.434	Jan 2016	12.619	Jan 2017	0.000		12.619	Continuing	Continuing	-
		Subtotal	16.566	15.772		20.007		23.245		0.000		23.245	-	-	-

Remarks

Other is only for travel

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Air Force			Date: February 2016
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	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	75.991	113.016		174.620		228.124		0.000		228.124	-	-	-

Remarks

Additional Prior Years funds for Advanced EHF MILSATCOM (Space) are in PE 0603430F, Project 64A030, Evolved AEHF MILSATCOM, Budget Activity 4.

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Air Force		Date: February 2016
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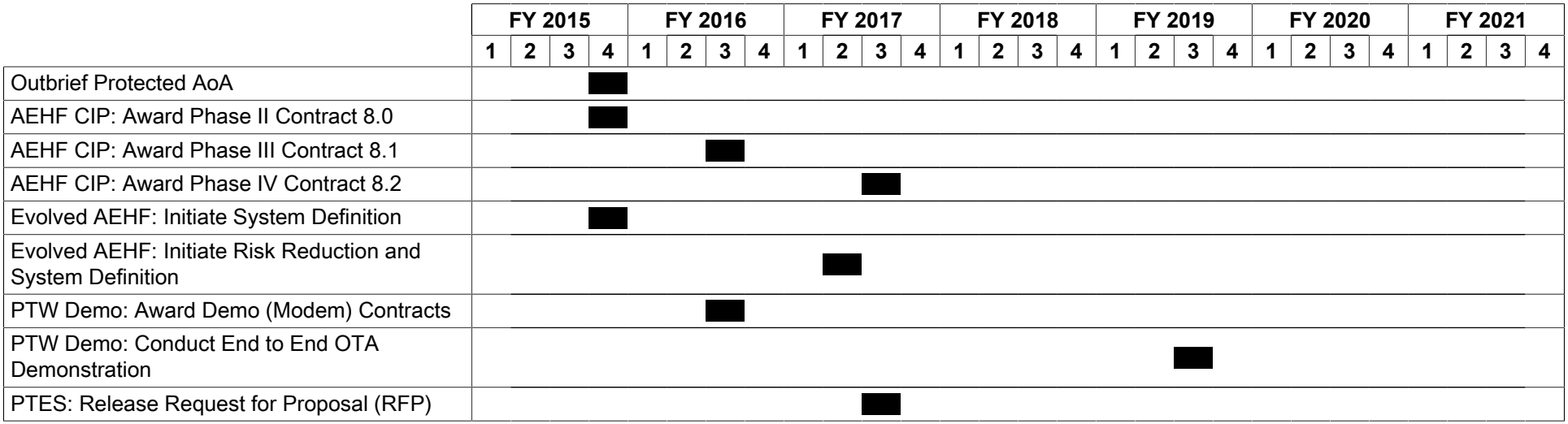

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Air Force		Date: February 2016
Appropriation/Budget Activity 3600 / 5	**R-1 Program Element (Number/Name)** PE 0605431F / *Advanced EHF MILSATCOM (SPACE)*	**Project (Number/Name)** 657104 / *Evolved AEHF MILSATCOM (EAM)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Outbrief Protected AoA	4	2015	4	2015
AEHF CIP: Award Phase II Contract 8.0	4	2015	4	2015
AEHF CIP: Award Phase III Contract 8.1	3	2016	3	2016
AEHF CIP: Award Phase IV Contract 8.2	3	2017	3	2017
Evolved AEHF: Initiate System Definition	4	2015	4	2015
Evolved AEHF: Initiate Risk Reduction and System Definition	2	2017	2	2017
PTW Demo: Award Demo (Modem) Contracts	3	2016	3	2016
PTW Demo: Conduct End to End OTA Demonstration	3	2019	3	2019
PTES: Release Request for Proposal (RFP)	3	2017	3	2017